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PLANETARY PHENOMENA FOR MAY AND JUNE, 1922

By Malcolm McNeill

PHASES OF THE MOON, PACIFIC TIME

First Quarter	May 4, 4^h56^m A.M.	First Quarter	June 2, 10^h10^m A.M.
Full Moon	May 10, 10 6 P.M.	Full Moon	June 9, 7 58 A.M.
Last Quarter	May 18, 10 17 A.M.	Last Quarter	June 17, 4 3 A.M.
New Moon	May 26, 10 4 A.M.	New Moon	June 24, 8 20 P.M.

The Sun reaches the summer solstice and summer begins June 21, 9^h27^m P. M. Pacific time.

Mercury is in the best position of the year for evening observation during the latter half of May and early June. It comes to greatest eastern elongation (22°37′) on May 23. The elongation is about an average one in point of distance from the Sun, but the planet is also several degrees north of the Sun, which increases the interval between sunset and the setting of the planet. By the middle of May the planet remains above the horizon considerably more than an hour and a half after sunset, and the interval does not become less than that until after June 1. After that time the distance between *Mercury* and the Sun rapidly becomes less and inferior conjunction is passed on the early morning of June 18. *Mercury* now becomes a morning star, but does not rise as much as an hour before sunrise until after July 1. The planet is at its brightest magnitude — 1.8 during the latter part of April while it is still too near the Sun for naked eye view, but grows fainter as it approaches greatest elongation when it is not materially brighter than a first magnitude star. This falling off of light is mainly due to diminution of phase.

Venus is an evening star, gradually increasing its distance from the Sun. On May 1 it remains above the horizon somewhat more than an hour and a half after sunset, and this interval increases to a little more than two hours by the end of June. During the two months it moves 79° eastward from *Aries* throug *Taurus* and *Gemini* into *Cancer*. On May 8 it passes about 6° north of the first magnitude star *Aldebaran, α Tauri*. Its magnitude is — 3.3 on May 1, and increases slowly as the planet swings around toward greatest elongation. It passes perihelion on May 26, but its orbit is so nearly circular that there is little change in brightness on that account.

Mars occupies the best position for observation since 1909. On May 1 it rises about half after ten P. M. and on June 30 a little before six P. M. It is in the constellation *Scorpio* and moves slowly eastward 17′ up to May 7, and then begins its westward or retrograde motion. By the end of June it will have moved about 14° from its May 7 position along a course considerably to the south of its course while moving eastward and almost in the direction of *Antares;* but it will cease its westward motion about the middle of July when it is about 4° from the star. The entire arc of regression is about 17°. *Mars* comes to opposition on June 10, 781 days after the previous opposition, which occurred April 21, 1920. The next opposition will occur August 23, 1924, 805 days after the opposition of 1922. This is not quite the maximum possible interval between successive oppositions. For instance, between the oppositions of 1907 July 6, and 1909 September 24 there was an interval of 811 days. The minimum interval may be only a little more than 760 days. From the opposition of 1916 February 9 to the opposition of 1918 March 15 the interval was only 764 days. The cause of this variation is the eccentricity of *Mars'* orbit. When the planet is in or near perihelion its actual velocity is much greater than when it is in aphelion. From one opposition to the next the Earth must make one more revolution than *Mars.* When the oppositions occur in summer *Mars* is near perihelion, therefore moving faster than the average, and the Earth takes longer to catch up. The same cause, the eccentricity of *Mars'* orbit, produces the much more ordinarily noticed phenomenon, the great difference of brightness of *Mars* at different oppositions, the maximum coming when opposition occurs late in August. Then *Mars* is in perihelion while the Earth is not far from aphelion, and the bodies are nearest each other. The present opposition of June 10 does not quite fulfill these conditions, but the following one in 1924 will be almost the best possible. During the present opposition *Mars* will for a few days be a trifle brighter than *Jupiter.*

Jupiter is in fine position for observation, being above the horizon on May 1 until nearly 4 A. M., and until about midnight on June 30. It is in the constellation *Virgo,* continuing its retrograde motion about 2° until June 6, and then moves eastward nearly 1° by the end of the month.

Saturn is near *Jupiter,* about 8° west, also in *Virgo;* and being about 4° north of *Jupiter* sets at about the same time, a little before 4 A. M. on May 1 and before midnight on June 30. It moves about 1° west up to June 4 and then resumes its eastward motion.

Uranus is a morning object, rising a little before 3 A. M. on May 1 and a little before 11 on June 30. It is in the constellation *Aquarius* and moves eastward about 1° up to June 18, and then begins to retrograde. No moderately bright star is near.

Neptune is above the horizon until about 1:30 A. M. on May 1 and until about 9:30 on June 30. On the latter date it is about 2° south of *Venus.*

NOTES FROM PACIFIC COAST OBSERVATORIES

The Total Solar Eclipse of September 21, 1922

A note in the October, 1921, number of these PUBLICATIONS described the astronomic and the probable atmospheric conditions under which the eclipse of September 21, 1922, will be observable at the Maldive Islands, Christmas Island, the Ninety-Mile Beach on the northwest coast of Australia, and the points accessible by railroad in southeastern Queensland.

It is expected that an expedition from the Kodiakanal Observatory, Southern India, in charge of Director Evershed, will locate in the Maldive Islands.

An expedition from the Royal Observatory, Greenwich, personnel consisting of Mr. and Mrs. Jones and Mr. Melotte, sailed from Liverpool in January for Christmas Island. The observers will arrive there several months in advance of the eclipse date, partly in order to obtain night photographs of the sky needed as reference plates in the Einstein problem, and likewise to conduct a well-considered program for comparing the brightness of